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Indian Standard

SINGLE POINT TOOL HOLDERS FOR TURNING AND COPYING FOR INDEXABLE INSERTS — DIMENSIONS

ICS 25.100.10

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

December 2000

Price Group 7

Single Point Cutting Tools, Carbide Tips and Indexable Inserts Sectional Committee, BP 12

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 5610 : 1998 'Single-point tool holdes for turning and copying, for indexable inserts – Dimensions' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendations of the Single Point Cutting Tools, Carbide Tips and Indexable Inserts Sectional Committee and approval of the Basic and Production Engineering Division Council.

The text of the ISO Standard has been approved as suitable for publication as Indian Standard without deviations. Certain conventions are however not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker in the International Standard while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In the adopted standard, reference appears to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard which is to be substituted in its place is listed below along with its degree of equivalence for the edition indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 3002-1 : 1982 Basic quantities in cutting and grinding — Part 1 : Geometry of the active part of cutting tools — General terms, reference systems, tool and working angles, chip breakers	IS 11522 (Part 1) : 1998 Basic quantities in cutting and grinding — Part 1 : Geometry of the active part of cutting tools — General terms, reference systems, tools and working angles, chip breakers	Identical

Indian Standard

SINGLE POINT TOOL HOLDERS FOR TURNING AND COPYING FOR INDEXABLE INSERTS — DIMENSIONS

1 Scope

This International Standard specifies the general dimensions of turning and copying single-point tool holders for indexable inserts, and specifies preferred tool holders (see clause 5).

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreement based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3002-1 :1982, *Basic quantities in cutting and grinding — Part 1 : Geometry of the active part of cutting tools — General terms, reference systems, tool and working angles, chip breakers.*

3 Remark

The designation of turning and copying tool holders is dealt with in ISO 5608; however, it should be noted that for preferred tool holders in accordance with clause 5, a dash replaces the letter symbol identifying tool length.

4 Dimensions

4.1 Shank

See figure 1 and table 1.

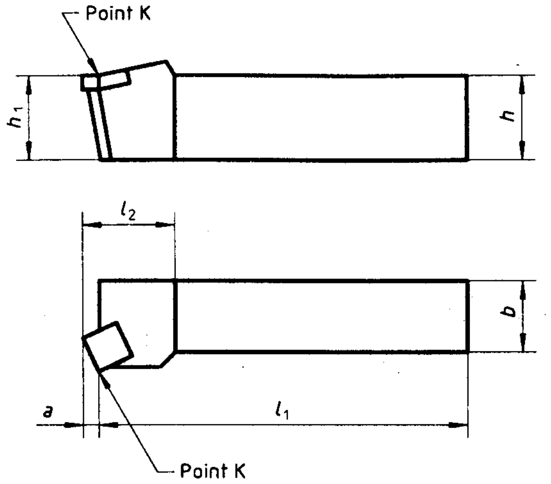


Figure 1

Table 1

Dimensions in millimetres

h h13		8	10	12	16	20	25	32	40	50
b h13	$b = h$	8	10	12	16	20	25	32	40	50
	$b = 0{,}8\,h$		8	10	12	16	20	25	32	40
l_1 k16	long tool holders	60	70	80	100	125	150	170	200	250
	short tool holders	40	50	60	70	80	100	125	150	—
h_1 js14		$h_1 = h$								

4.2 Head length l_2

See figure 1 and table 2.

The head lengths given in table 2 do not apply to tool holders with rhombic indexable inserts shapes D and V (see ISO 5608).

Table 2

Dimensions in millimetres

Diameter of the inscribed circle of the insert	l_2 max.
6,35	25
9,525	32
12,7	36
15,875	40
19,05	45
25,4	50

4.3 Dimensions *f*

See the figures in clause 5 and table 3.

Table 3

Dimensions in millimetres

b	*f*				
	Series 1 [1]	**Series 2** $^{+0,5}_{0}$	**Series 3** $^{+0,5}_{0}$	**Series 4** $^{+0,5}_{0}$	**Series 5** $^{+0,5}_{0}$
8	4	7	8,5	9	10
10	5	9	10,5	11	12
12	6	11	12,5	13	16
16	8	13	16,5	17	20
20	10	17	20,5	22	25
25	12,5	22	25,5	27	32
32	16	27	33	35	40
40	20	35	41	43	50
50	25	43	51	53	60
For tool holders style	D, N, V	B, T	A	R	F, G, H, J, K, L, S

1) Tolerance for symmetrical tool holders (styles D and V): ± 0,25

Tolerance for non-symmetrical tool holders (style N): $^{+0,5}_{0}$

4.4 Identification of dimensions l_1, *f* and h_1

4.4.1 The length dimension l_1 is the distance from the specified point K (see figures 2 to 5) to the end of the shank.

Dimension *f* is the distance between the specified point K and the rear backing surface of the tool holder.

Dimension h_1 is the height of specified point K above the base of the tool holder.

The values of l_1 as specified in 4.1, *f* as specified in 4.3 and h_1, as specified in 4.1 are given for tool holders equipped with master inserts having corner radii in accordance with 4.4.3.

For tools style S, side rake is equal to back rake.

Special case of tool styles D and S with round inserts:

For tools style D (see figure 6), point K is defined as the intersection of:

— a plane parallel to P_f passing through the axis of the insert;

— a plane perpendicular to P_f and tangential to the cutting edge;

— a plane containing A_γ.

For tools style S (see figure 7), there are two cases of point K. These are defined by two planes P_f in directions of two main perpendicular feeds and which are tangential to the cutting edge of the insert.

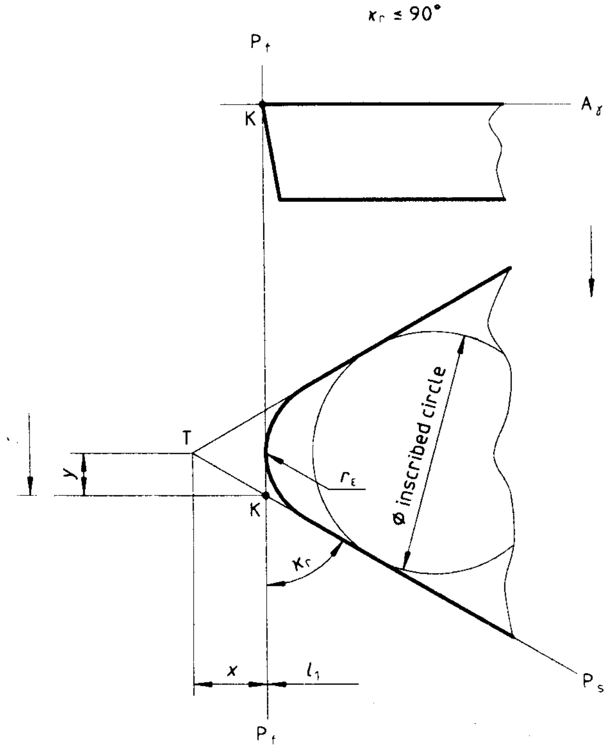


Figure 2

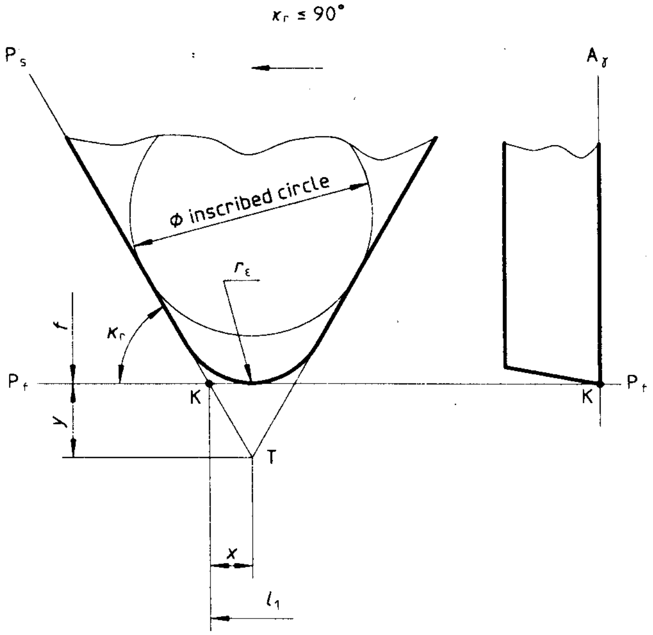


Figure 3

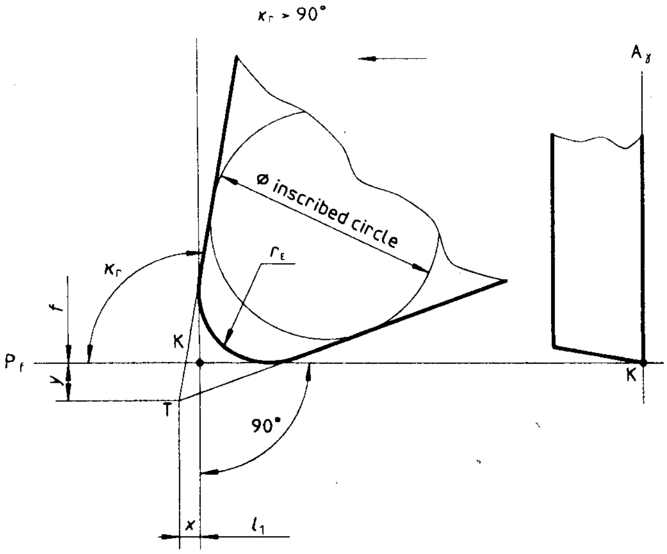


Figure 4

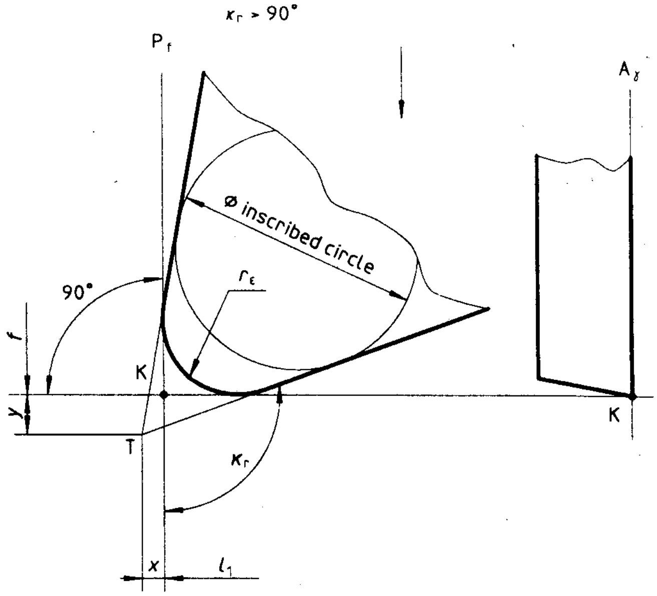


Figure 5

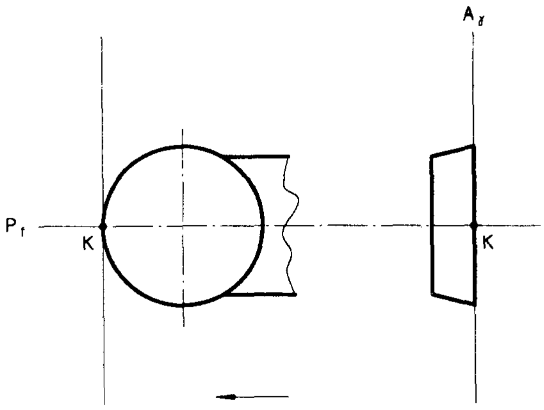


Figure 6

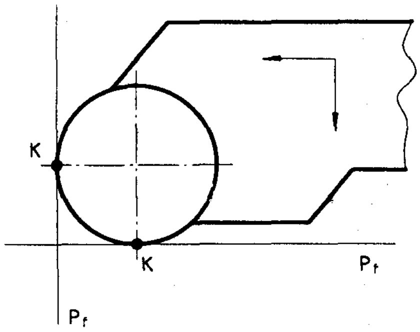


Figure 7

4.4.2 The specified point K is defined as follows:

Consider planes P_f (assumed working plane) and P_s (tool cutting edge plane) according to ISO 3002-1 for a selected point on the major cutting edge (for example point of tangency of major cutting edge with inscribed circle).

a) For $\kappa_r \leq 90°$, point K is defined as the intersection of plane P_s, a plane parallel to plane P_f tangent to the corner radius and a plane containing the tool face A_γ (see figures 2 and 3).

b) For $\kappa_r > 90°$, point K is defined as the intersection of a plane parallel to plane P_f tangent to the corner radius, a plane perpendicular to plane P_f tangent to the corner radius and a plane containing the tool face A_γ (see figures 4 and 5).

4.4.3 The corner radius r_ε of the master inserts used for the definition of dimensions l_1, f and h_1 is a function of the diameter of the inscribed circle of the insert, as indicated in table 4.

Table 4

Dimensions in millimetres

Diameter of the inscribed circle	6,35	7,94	9,525	12,7	15,875	19,05	25,4
Corner radius r_ε (nominal)	0,4		0,8		1,2		2,4

NOTE 1 Dimensions l_1, f and h_1 are based on corner radii r_ε converted from inch values, i.e. r_ε = 0,397 mm, 0,794 mm, 1,191 mm and 2,381 mm.

4.4.4 The tolerance ± 0,25 mm on dimension f for series 1 refers to symmetrical tool holders (styles D and V). Therefore, deviating from the definition given in 4.4.2, the values in table 3 are given in relation to the theoretical intersection of the cutting edges (theoretical corner T).

For particular tool holders, dimension f shall be given in accordance with the definition in 4.4.2, and shall therefore be corrected to a value rounded off to 0,1 mm depending on the included angle ε_r, the corner radius r_ε (see 4.4.6) and the cutting edge angle κ_r.

4.4.5 The tolerance ± 0,25 mm on dimension f for series 1 does not include the tolerance on the shank width b.

4.4.6 Tool holders may be equipped with inserts of size in accordance with clause 5 and any corner radius r_ε.

For corner radii r_ε other than those specified in 4.4.3, dimensions l_1 and f shall be corrected by using the values x and y (see figures 2 to 5), which are the distances from the specified point K to the theoretical corner T.

The new dimensions l_1 and f are found from the differences between x and y corresponding to the corner radius according to 4.4.3, and x and y corresponding to the real corner radius.

5 Preferred tool holders

See table 5.

Table 5

Dimensions in millimetres

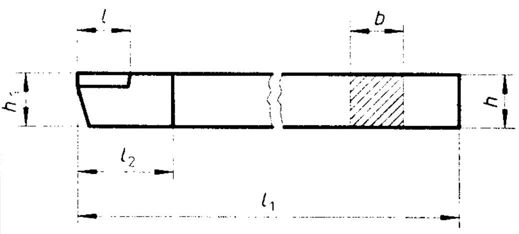
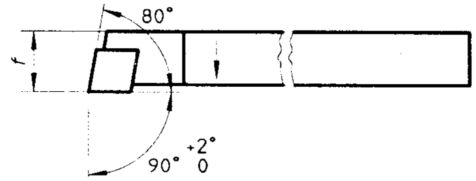
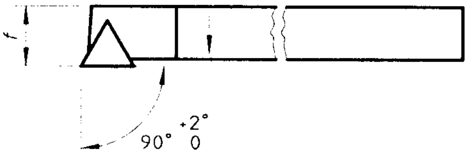
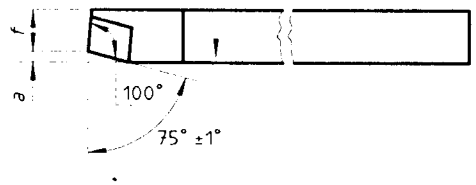
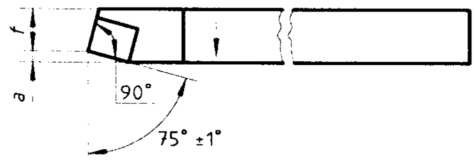
Style		$h \times b$	08 08	10 10	12 12	16 16	20 20	25 25	32 25	32 32	40 32	40 32	40 40	50 50
		l_1 k16	60	70	80	100	125	150	170	170	150	200	200	250
		h_1 js14	8	10	12	16	20	25	32	32	40	40	40	
A		$f^{+0,5}_{0}$ (series 3)	8,5	10,5										
		l (designation	06	06										
		l_2 max.	25	25										
		$f^{+0,5}_{0}$ (series 3)			12,5	16,5	20,5	25,5	25,5	33			41	
		l (designation			11	11	16	16	16	22			22	
		l_2 max.			25	25	32	32	32	36			36	
B		$f^{+0,5}_{0}$ (series 2)	7	9	11									
		l (designation	06	06	06									
		l_2 max.	25	25	25									
		a 1)	1,6	1,6	1,6									
		$f^{+0,5}_{0}$ (series 2)				13	17	22	22	27			35	43
		l (designation				09	12	12	12	19			19	25
		l_2 max.				32	36	36	36	45			45	50
		a 1)				2,2	3,1	3,1	3,1	4,6			4,6	5,9

Table 5 (*continued*)

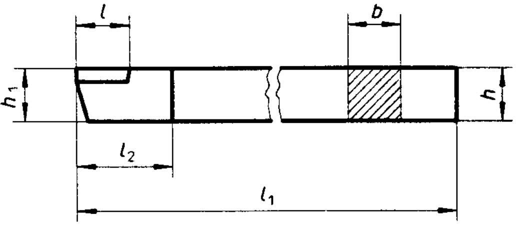
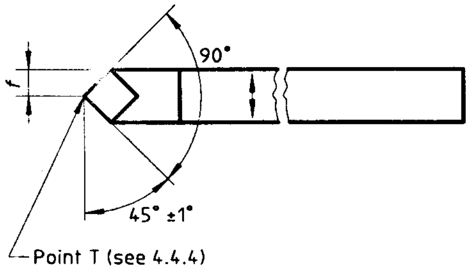
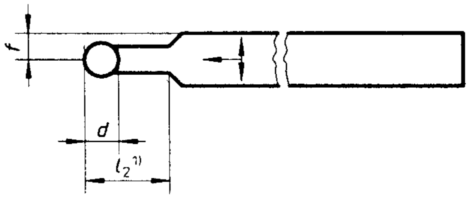
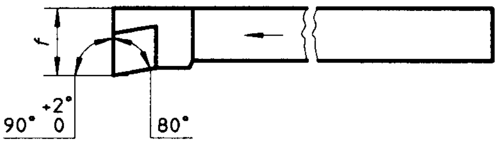
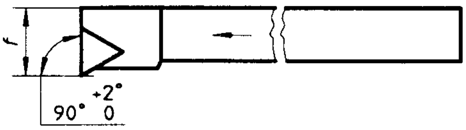
Style		$h \times b$	08 08	10 10	12 12	16 16	20 20	25 25	32 25	32 32	40 32	40 32	40 40	50 50
		l_1 k16	60	70	80	100	125	150	170	170	150	200	200	250
		h_1 js14	8	10	12	16	20	25	32	32	40	40	40	50
D[2]		$f \pm 0,25$ (series 1)			6	8	10	12,5	12,5	16				
		l (designation			09	09	12	12	12	19				
		l_2 max.			32	32	36	36	36	45				
	 1) l_2 min. = 1,5d	$f \pm 0,25$ (series 1)	4	5	6	8	10	12,5	12,5	16			20	
		d (designation	06	06/08	06/08	06/ 08/10	06/ 08/ 10/12	06/ 08/ 10/ 12/ 16	12/16	20			25	
F		$f^{+0,5}_{0}$ (series 5)	10	12										
		l (designation	06	06										
		l_2 max.	25	25										
		$f^{+0,5}_{0}$ (series 5)			16	20	25	32	32	40			50	
		l (designation			11	11/16	16	16/22	16/22	22			22/27	
		l_2 max.			25	25/32	32	32/36	32/36	36			36/40	

Table 5 (*continued*)

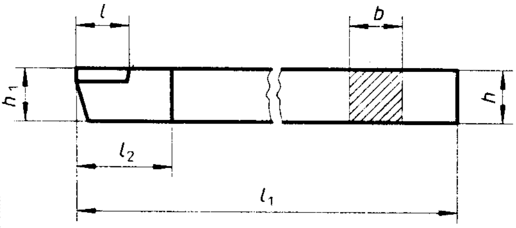
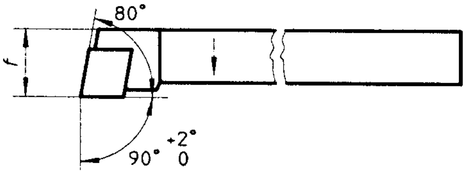
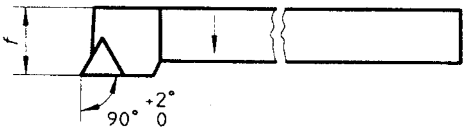
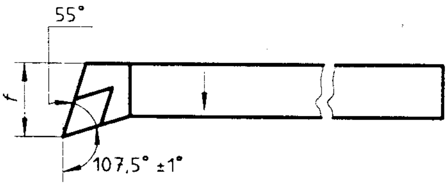
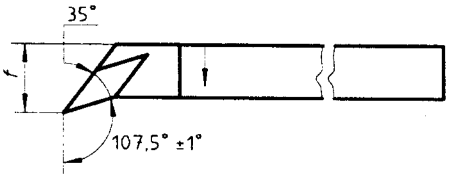
Style														
Style		$h \times h$	08 08	10 10	12 12	16 16	20 20	25 25	32 25	32 32	40 32	40 32	40 40	50 50
		l_1 k16	60	70	80	100	125	150	170	170	150	200	200	250
		h_1 js14	8	10	12	16	20	25	32	32	40	40	40	50
G		$f\ ^{+0,5}_{\ \ 0}$ (series 5)	10	12										
		l (designation)	06	06										
		l_2 max.	25	25										
		$f\ ^{+0,5}_{\ \ 0}$ (series 5)			16	20	25	32	32	40			50	60
		l (designation)			11	11/16	16	16/22	16/22	22			22/27	27
		l_2 max.			25	25/32	32	32/36	32/36	36			36/40	40
H		$f\ ^{+0,5}_{\ \ 0}$ (series 5)		12	16	20	25	32	32					
		l (designation)		07	07/11	11	11/15	15	15					
		l_2 max.		25	25/32	32	32/40	40	40					
		$f\ ^{+0,5}_{\ \ 0}$ (series 5)			16	20	25	32	32					
		l (designation)			11/13	11/13	13/16	16	16					
		l_2 max.			25/32	25/32	32/40	40	40					

Table 5 (*continued*)

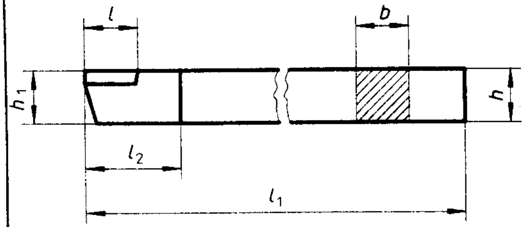
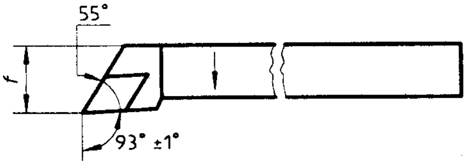
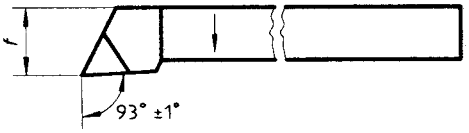
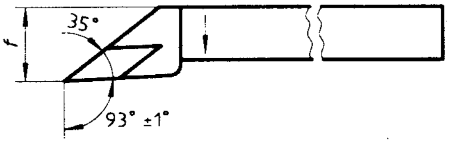
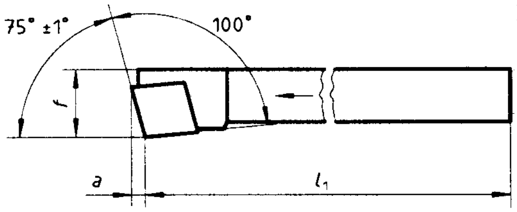
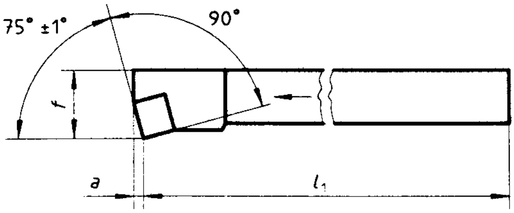
Style		$h \times b$	08 08	10 10	12 12	16 16	20 20	25 25	32 25	32 32	40 32	40 32	40 40	50 50
		l_1 k16	60	70	80	100	125	150	170	170	150	200	200	250
		h_1 js14	8	10	12	16	20	25	32	32	40	40	40	50
J		$f\ ^{+0,5}_{0}$ (series 5)	10	12	16	20	25	32	32			40		
		l (designation)	07	07	11	11	15	15	15			15		
		l_2 max.	25	25	32	32	40	40	40			40		
		$f\ ^{+0,5}_{0}$ (series 5)					25	32	32			40		
		l (designation)					16	16/22	16/22			22/27		
		l_2 max.					32	32/36	32/36			36/40		
		$f\ ^{+0,5}_{0}$ (series 5)			16	20	25	32	32					
		l (designation)			11/13	11/13	13/16	16	16					
		l_2 max.			25/32	25/32	32/40	40	40					
K		$f\ ^{+0,5}_{0}$ (series 5)	10	12										
		l (designation)	06	06										
		l_2 max.	25	25										
		a[1]	1,6	1,6										
		$f\ ^{+0,5}_{0}$ (series 5)			16	20	25	32	32	40			50	
		l (designation)			09	09/12	12	12/19	12/19	19			19/25	
		l_2 max.			32	32/36	36	36/45	36/45	45			45/50	
		a[1]			2,2	2,2/3,1	3,1	3,1/4,6	3,1/4,6	4,6			4,6/5.9	

Table 5 (*continued*)

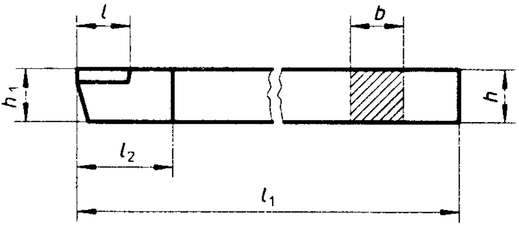
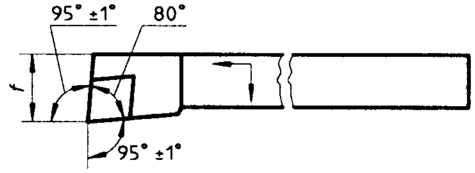
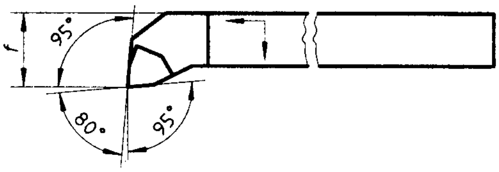
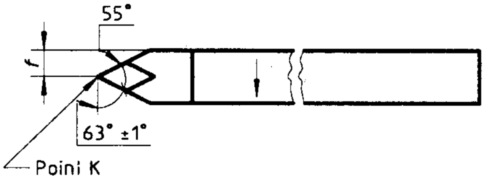
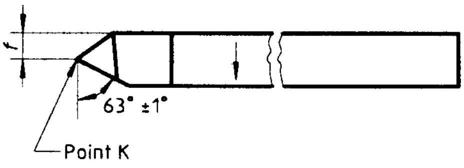
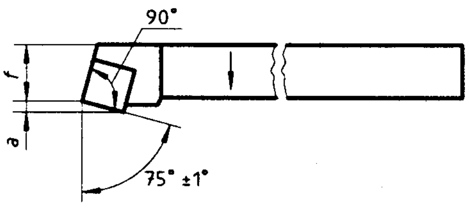
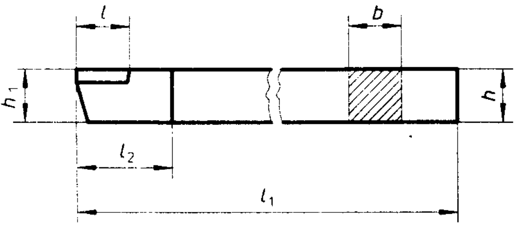
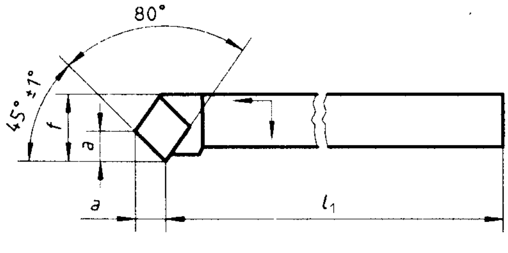
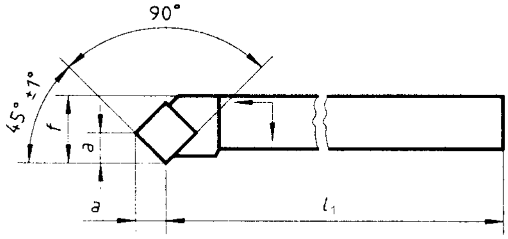
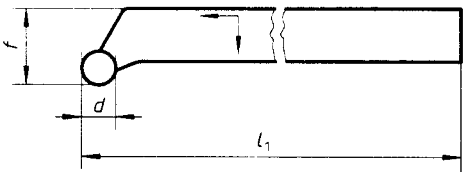
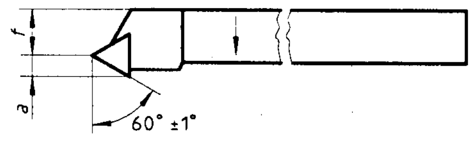
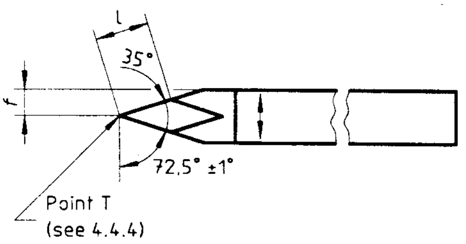
Style			08 08	10 10	12 12	16 16	20 20	25 25	32 25	32 32	40 32	40 32	40 40	50 50
Style		$h \times b$	08 08	10 10	12 12	16 16	20 20	25 25	32 25	32 32	40 32	40 32	40 40	50 50
		l_1 k16	60	70	80	100	125	150	170	170	150	200	200	250
		h_1 js14	8	10	12	16	20	25	32	32	40	40	40	50
L		$f\ ^{+0,5}_{0}$ (series 5)	10	12	16	20	25	32	32	40			50	
		l (designation)	06	06	09	09/19	12	12/19	12/19	19			19	
		l_2 max.	25	25	32	32/36	36	36/45	36/45	40			45	
		$f\ ^{+0,5}_{0}$ (series 5)	10	12	16	20	25	32	32	40				
		l for inserts style W (designation)	04	04	04	06	06/ 08	06/ 08	06/ 08	08				
		l_2 max.	25	25	25	36	36/ 45	36/ 45	36/ 45	45				
N		$f\ ^{+0,5}_{0}$ (series 1)	4	5	6	8	10	12,5	12,5		16			
		l (designation)	07	07	11	11	11/15	15	15		15			
		l_2 max.	25	25	32	32	32/36	45	45		45			
		$f\ ^{+0,5}_{0}$ (series 1)						12,5	12,5		16			
		l (designation)						16/22	16/22		16/22			
		l_2 max.						32/36	32/36		32/36			
R		$f\ ^{+0,5}_{0}$ (series 4)			13	17	22	27	27	35			43	53
		l (designation)			09	09/12	12	12/19	12/19	19			19/25	25
		l_2 max.			32	32/36	36	36/45	36/45	45			45/50	50
		$a^{1)}$			2,2	2,2/3,1	3,1	3,1/4,6	3,1/4,6	4,6			4,6/5,9	5,9

Table 5 (*concluded*)

Style		$h \times b$	08 08	10 10	12 12	16 16	20 20	25 25	32 25	32 32	40 32	40 32	40 40	50 50
		l_1 k16	60	70	80	100	125	150	170	170	150	200	200	250
		h_1 js14	8	10	12	16	20	25	32	32	40	40	40	50
S 2)		$f^{+0,5}_{0}$ (series 5)	10	12										
		l (designation	06	06										
		l_2 max.	25	25										
		a 1)	4,2	4,2										
		$f^{+0,5}_{0}$ (series 5)			16	20	25	32	32	40			50	50
		l (designation			09	09/12	12	12/19	12/19	19			19/25	25
		l_2 max.			32	32/36	36	36/45	36/45	45			45/50	50
		a 1)			6,1	6,1/ 8,3	8,3	8,3/ 12,5	8,3/ 12,5	12,5			12,5/ 16	16
		$f^{+0,5}_{0}$ (series 5)	10	12	16	20	25	32	32	40			50	
		l (designation	06	06/08	06/08	06/ 08/10	06/ 08/ 10/12	06/ 08/ 10/ 12/16	12/16	20			25	
		l_2 max.	25	25	32	32	36	40	40	45			50	
T		$f^{+0,5}_{0}$ (series 2)			11	13	17	22	22	27			35	
		l (designation			11	11	16	16	16	22			27	
		l_2 max.			25	25	32	32	32	36			40	
		a 1)			5	5	7,2	7,2	7,2	10			12,2	
V		$f \pm 0,25$ (series 1)			6	8	10	12,5	12,5					
		l (designation			11/13	11/13	13/16	16	16					
		l_2 max.			25/32	25/32	32/40	40	40					

1) Dimension a refers to tool holders having rake $\gamma_o = 0°$, cutting edge inclination $\lambda_s = 0°$ and master inserts with corner radii r_ε in accordance with 4.4.3. For the rake γ_o and cutting edge inclination λ_s varying between ± 6°, variations in a are less than 0,1 mm and are thus negligible.

2) For tools of this type equipped with round inserts, the value of the cutting edge angle is not stated.

Annex A
(informative)

Bibliography

[1] ISO 883:1985, *Indexable hardmetal (carbide) inserts with rounded corners, without fixing hole — Dimensions.*

[2] ISO 3364:1997, *Indexable hardmetal (carbide) inserts with rounded corners, with cylindrical fixing hole — Dimensions.*

[3] ISO 5608:1995, *Turning and copying tool holders and cartridges for indexable inserts — Designation.*

[4] ISO 6987:1998, *Indexable hard material inserts with rounded corners, with partly cylindrical fixing hole — Dimensions.*

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